

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An uplink transmitting device in a mobile communication system, comprising:

an encoder for receiving an information bit stream and for ~~generating~~ outputting three streams, one of an information ~~bitsymbol~~ stream, one of a first parity ~~streams~~symbol, and one of a second parity ~~streams~~symbol by encoding the information bit stream;

an interleaver for interleaving the encoded ~~symbols~~ streams by a predetermined interleaving rule;

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a radio frame segmenter for receiving the interleaved ~~streams~~symbols from the interleaver and ~~outputting the received symbols in at least one radio frame, each of the at least one radio frame having the same size~~ mapping the received interleaved stream onto at least one consecutive radio frame;

a demultiplexer for ~~demultiplexing~~ separating each of the at least one radio frames received from the radio frame segmenter back into said three streams, one of information symbols, one of first parity symbols, and one of second parity symbols; and

a rate matcher for bypassing the information ~~symbols~~ bit stream and for puncturing a parts of the first and second parity ~~symbols~~ streams according to a given rate matching rule.

2. (Currently Amended) The transmitting device of claim 1, wherein ~~the size of the at least one information bit stream is mapped onto consecutive radio frames when the transmission time interval (TTI) of the information bit stream is longer than 10 ms.~~

3. (Currently Amended) The transmitting device of claim 1, wherein ~~the information bit stream is transmitted at a predetermined transmission time interval (TTI), said TTI being of the information bit stream is one of 10, 20, 40, and 80ms.~~

4. (Currently Amended) The transmitting device of claim 1, wherein the interleaving rule is a bit reverse ~~column transposition~~ method.

5. (Currently Amended) The transmitting device of claim 1, wherein ~~the symbols an~~ arrangement of the information symbols and the parity symbols in each radio frame has a regular pattern in each radio frame are repeated according to an pattern.

6. (Cancelled)

7. (Currently Amended) The transmitting device of claim 6~~2~~, wherein ~~a the consecutive plurality of the at least one radio frames~~ have initial symbols determined by a TTI.

8. (Currently Amended) The transmitting device of claim 5, wherein the demultiplexer ~~demultiplexes separates symbols of the radio frame into the three stream each of the symbols in the at least one radio frame into information symbols, first parity symbols, and second parity symbols according to a swiching rule determined by the TTI and according to the repetition regular pattern of each of the radio frames~~ corresponding to the radio frame.

9. (Currently Amended) The transmitting device of claim 8, further comprising:
a memory for storing initial symbols of ~~the plurality of the at least one consecutive~~ radio frames; and

a controller for ~~controlling the demultiplexer according to the repetition regular pattern and the stored initial symbols of the at least one radio frames.~~

10. (Currently Amended) The transmitting device of claim 9, further comprising:
a multiplexer for multiplexing the outputs of the rate matcher ~~according to under a control of the controller controlling the demultiplexer.~~

11. (Currently Amended) The transmitting device of claim 1, wherein the interleaver interleaving the encoded streams at a TTI (Transmission Time Interval) after inserting inserts filler bits between into the encoded streams the symbols in order to equalize the a size of radio frames.

12. (Original) The transmitting device of claim 1, wherein the rate matcher comprises:

a first component rate matcher for rate-matching the information symbols;
a second component rate matcher for rate-matching the first parity symbols; and
a third component rate matcher for rate-matching the second parity symbols.

13. (Currently Amended) A transmitting device in a mobile communication system, comprising:

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an encoder for receiving an information bit stream transmitted at a predetermined transmission time interval (TTI) and for ~~generating~~ outputting an ~~the~~ information bit stream ~~information symbol~~ and at least one type of parity stream by encoding the information bit stream ~~symbol corresponding to the information symbol by encoding each of the received information bit, the number of the at least one parity symbol corresponding to each information symbol being dependent on~~ in accordance with a coding rate of said encoder;

an interleaver for receiving the information bit stream ~~symbols~~ and the at least one type of parity stream ~~symbols~~ from the encoder, for interleaving the information bit stream ~~symbols~~ and the at least one type of parity stream ~~symbols~~ and for outputting interleaved stream ~~symbols~~;

a radio frame segmenter for receiving the interleaved streams ~~symbols~~ from the interleaver, for dividing the received streams ~~symbols~~ into at least one radio frames, and for outputting the at least one radio frames in sequence, ~~each of the at least one radio frame having a predetermined time frame;~~

a ~~rate matcher for rate matching received symbols and for outputting rate matched symbols, said rate matcher having an information symbol component for rate matching information symbols and at least one parity symbol component for rate matching parity symbols, the number of parity symbol components being equal to the number of the parity symbols corresponding to each information symbol; and~~

a demultiplexer for receiving the at least one radio frames and for demultiplexing the received radio frames back into the information bit stream and the at least one kind type of parity stream ~~symbols in each of the at least one radio frame by switching each of the symbols in the radio frames to a corresponding component of the rate matcher; and~~

a rate matcher for rate matching the streams received from the demultiplexer and outputting rate matched streams, said rate matcher having at least one component rate matcher

for rate matching a part of the parity stream, a number of the at least one component rate matcher being equal to a number of the parity streams,

wherein the demultiplexer switches each of the parity symbols in the radio frames to said at least one component rate matcher corresponding to each of the parity symbols~~in accordance with a symbol repetition pattern assigned to each of the radio frames.~~

14. (Currently Amended) The transmitter device of claim 13~~16~~, wherein the ~~symbol repetition~~regular pattern is determined by the TTI.

15. (Currently Amended) The transmitter device of claim 14, wherein the ~~regular~~symbol repetition pattern is further determined by the coding rate.

16. (Currently Amended) The transmitter device of claim 14, ~~wherein the symbol repetition pattern is further determined by the total number of filler bits used by the radio frame segment~~13, wherein symbols of the radio frame are separated to the at least one component rate matcher corresponding each type of parity stream in accordance with a regular pattern for arranging information symbols and parity symbols in each radio frame.

17. (Currently Amended) The transmitter device of claim 13, further comprising:
a multiplexer for multiplexing the rate matched ~~symbols~~streams ~~by synchronizing the multiplexing with the demultiplexer by switching to~~outputs of the corresponding component in the rate matcherat least one component rate matcher.

18. (Currently Amended) The transmitter device of claim 17, further comprising:
a controller for controlling the switching of the demultiplexer and the multiplexer based on at least one of the TTI and the length of each of the~~at least one~~ radio frames.

19. (Cancelled)

20. (Currently Amended) The transmitter device of claim 13, wherein ~~the predetermined a length of time of each of the at least one~~ radio frames is 10ms.

21. (Original) The transmitter device of claim 13, wherein the TTI is one of 10, 20, 40 and 80 ms.

22. (Original) The transmitter device of claim 13, wherein the coding rate is 1/3.

23. (Cancelled)

24. (Cancelled)

25. (Currently Amended) The transmitter device of claim 13, further comprising a memory for storing the symbol repetition regular pattern including an initial symbol of corresponding to each of the at least one radio frames.

26. (Original) The transmitter device of claim 13, wherein the encoder is a turbo encoder.

27. (Currently Amended) A method of transmitting in a mobile communication system, the method comprising the steps of:

receiving an information bit stream transmitted at a predetermined transmission time interval (TTI);

generating encoding an information symbol the information bit stream and outputting the encoded information bit stream and at least one type of parity symbol stream corresponding to the information symbol bit stream by encoding each of the received information bit, the a number of the parity symbols streams corresponding to each information symbol being dependent on a coding rate of said an encoder;

interleaving the information bit stream and the parity stream the information symbols and the parity symbols and outputting the interleaved symbols stream;

dividing the interleaved symbols stream into at least one radio frame and outputting the at least one radio frame, each of the at least one radio frame having a predetermined time frame;

demultiplexing the received radio frame back into the information bit stream and at least one type of parity stream the symbols in each of the at least one radio frame by switching each of

~~the symbols in the at least one radio frame to a corresponding component in a rate matcher, said rate matcher having an information symbol component for rate matching information symbols and at least one parity symbol component for rate matching parity symbols, the number of parity symbol components being equal to the number of the parity symbols corresponding to each information symbol; and~~

~~rate matching the demultiplexed symbols streams by a rate matcher;~~

~~wherein each parity symbol in the radio frame is switched to a component rate matcher corresponding to each of the at least one parity stream, said component rate matcher having at least one parity component rate matcher for rate matching a part of said at least one parity stream, a number of the at least one parity component rate matcher being equal to a number of the at least one parity stream; the information symbols are switched to the information symbol component and the parity symbols are switched to the parity symbol component in accordance with a symbol repetition pattern assigned to each of the at least one radio frame.~~

28. (Currently Amended) The method of claim 27~~30~~, wherein the symbol repetition~~regular~~ pattern is determined by the TTI.

29. (Currently Amended) The method of claim 28, wherein the ~~regular~~symbol repetition pattern is further determined by the coding rate.

30. (Currently Amended) The method of claim 28, ~~wherein the symbol repetition pattern is further determined by a total number of filler bits used by a radio frame segmenter~~27, wherein symbols of the at least one radio frame are separated to the component rate matcher by the demultiplexer in accordance with a regular pattern for arranging information symbols and parity symbols in each radio frame.

31. (Currently Amended) The method of claim 27, further comprising the step of:

~~multiplexing the rate matched symbols streams by synchronizing the multiplexing with the demultiplexing through by switching to the corresponding component in the rate matcher.~~

32. (Currently Amended) The method of claim 27, wherein the predetermined ~~time frame~~ of each of at least one length of the radio frame is 10ms.

33. (Original) The method of claim 27, wherein the TTI is one of 10, 20, 40 and 80 ms.

34. (Original) The method of claim 27, wherein the coding rate is 1/3.

35. (Cancelled)

36. (Cancelled)

37. (Currently Amended) A transmitting device in a mobile communication system, comprising:

an encoder for receiving an information bit stream transmitted at a predetermined transmission time interval (TTI) and for outputting the ~~generating an~~ information bit stream~~symbol~~ and at least one kind of parity stream~~symbol~~ corresponding to the information bit stream ~~symbol by encoding each of the received information bits, the number of the parity symbols corresponding to each information symbol being dependent on~~ in accordance with a coding rate of said encoder;

an interleaver for receiving the information bit stream~~symbols~~ and the parity stream~~symbols~~ from the encoder, for interleaving the information bit stream ~~symbols~~ and the parity stream~~symbols~~, and for outputting an interleaved stream ~~in a plurality of radio frames, each of the radio frames having a predetermined number of symbols;~~

~~a rate matcher for rate matching received symbols, said rate matcher having an information symbol component for rate matching information symbols and at least one parity symbol component for rate matching parity symbols; and~~

a demultiplexer for receiving the radio frames interleaved stream and for demultiplexing the received interleaved stream back into the information bit stream and the at least one kind of parity stream ~~the symbols in each of the radio frames by switching each of the symbols to a corresponding component in the rate matcher; and~~

a rate matcher for rate matching the information bit stream and the at least one kind of parity stream received from the demultiplexer, wherein said rate matcher includes at least one component rate matcher for rate matching a part of the at least one kind of parity stream, and a number of the component rate matcher is equal to a number of the at least one kind of parity stream,

wherein the demultiplexer switches each symbol in the interleaved stream to the component rate matcher corresponding to each of the at least one kind of parity stream.

38. (Currently Amended) The transmitter device of claim 37, wherein the demultiplexer switches ~~in order to separate the information symbols and the parity symbols~~ each of the symbols of the interleaved stream to the at least one component rate matcher in accordance with a regular pattern for arranging information symbols and parity symbols in the interleaved stream.

39. (Cancelled)

40. (Cancelled)

41. (Currently Amended) The transmitter device of claim ~~40~~38, wherein the ~~symbol repetition patterns are determined by the total number of filler bits~~ regular pattern is determined by the TTI.

42. (Currently Amended) The transmitter device of claim ~~37~~38, further comprising:
a multiplexer for synchronously multiplexing the output symbols of the at least one component rate matchers by synchronizing with the demultiplexer.

43. (Currently Amended) The transmitter device of claim 42, further comprising:
a controller for controlling ~~the switching of the demultiplexer and the multiplexer based on an initial symbol and repetition~~ the regular pattern.

44. (Cancelled)

45. (Currently Amended) The transmitter device of claim 37, wherein a ~~predetermined time frame of each of the~~ length of at least one of the radio frames ~~information bit stream and the interleaved stream~~ is 10ms.

46. (Original) The transmitter device of claim 37, wherein the TTI is one of 10, 20, 40 and 80 ms.

47. (Original) The transmitter device of claim 37, wherein the coding rate is 1/3.

48. (Cancelled)

49. (Currently Amended) The transmitter device of claim 41, further comprising:
a memory for storing the ~~symbol repetition~~ regular pattern including an initial symbol of corresponding to each of the radio frames ~~the interleaved stream~~.

50. (Original) The transmitter device of claim 37, wherein the encoder is a turbo encoder.

51. (Currently Amended) A method of transmitting in a mobile communication system, the method comprising the steps of:

receiving an information bit stream at a predetermined transmission time interval (TTI);
encoding the information bit stream and outputting the encoded information bit stream
~~generating information symbols and at least one kind of parity symbols stream~~ corresponding to the information symbol bit stream by in accordance with a coding rate of a encoder ~~encoding each of the received information bits;~~

interleaving the information bit streams ~~symbols~~ and the parity stream ~~symbols~~ and outputting an interleaved symbols ~~in a plurality of radio frames~~ stream;

demultiplexing the interleaved stream back into the information bit stream and the at least one kind of parity streams ~~symbols~~ in each of the radio frames by ~~switching each of the symbols in the radio frames to a corresponding component in a rate matcher, said rate matcher having an information symbol component for rate matching information symbols and at least one parity symbol component for rate matching parity symbols; and~~

rate matching the demultiplexed streams by a rate matcher, said rate matcher including at least one component rate matcher for rate matching a part of said at least one kind parity streamsymbols;

wherein each parity symbol in the interleaved stream are switched to at least one parity component rate matcher corresponding to each of the at least one kind of parity stream, a number of the at least one parity component rate matcher being equal to a number of the at least one parity stream~~the information symbols are switched to the information symbol component and the parity symbols are switched to the parity symbol component in accordance with a symbol repetition pattern assigned to each of the radio frames.~~

52. (Currently Amended) The method of claim ~~51~~53, wherein the ~~repetition~~regular pattern is determined by the TTI.

53. (Currently Amended) The method of claim ~~52~~, wherein ~~the repetition pattern is further determined by an index of the radio frame~~50, wherein symbols of the interleaved stream are separated in accordance with a regular pattern for arranging information symbols and parity symbols in the interleaved stream.

54. (Cancelled)

55. (Currently Amended) The method of claim 51, further comprising the step of:
multiplexing the output symbols of the rate matching step by synchronizing the multiplexing with the demultiplexing by switching ~~to the corresponding component in the rate matcher.~~

56. (Currently Amended) The method of claim 51, wherein a ~~predetermined time frame of each of the~~ length of at least one of the radio frames information bit stream and the interleaved stream is 10ms.

57. (Original) The method of claim 51, wherein the TTI is one of 10, 20, 40 and 80 ms.

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58. (Original) The method of claim 51, wherein the coding rate is $1/3$.

59. (Cancelled)

60. (Cancelled)